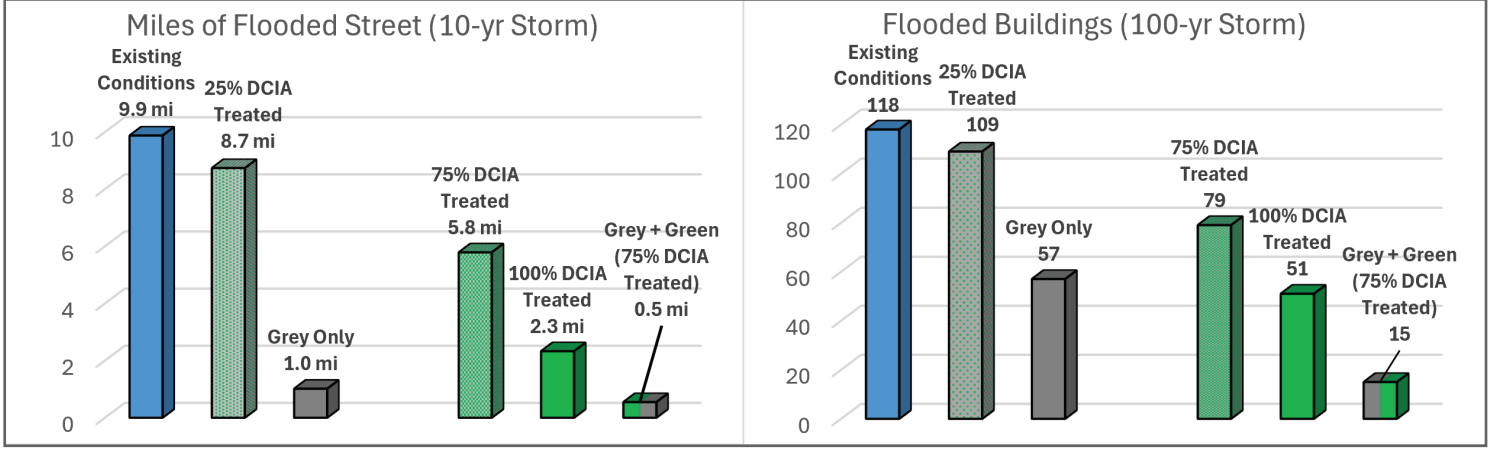
City of Madison Green Infrastructure Flood Mitigation Effectiveness Study Summary

The City of Madison conducted an extensive modeling analysis on the effectiveness of broad-scale **green infrastructure (GI)** for flood mitigation in the Pheasant Branch Watershed. The study concluded that while **widescale GI can reduce flooding, it is less effective and more costly than grey infrastructure solutions**. Treatment of up to 75% of the **directly connected impervious areas (DCIA,** e.g. sidewalks, driveways, streets, etc. that drain directly to the storm sewer system) is needed to approach the City's targets for flood mitigation in large storm events comparably to grey infrastructure. A detailed analysis of land use, slopes, and other factors in the Pheasant Branch Watershed indicated that even achieving a 25% DCIA treatment is very ambitious.

The challenge is so great that **even if the entire Pheasant Branch watershed was pervious, the City's flood mitigation targets wouldn't be met**. Indicating that the existing built stormwater conveyance (grey) infrastructure is the most limiting factor in the watershed.

Pheasant Branch Watershed GI Flood Mitigation Performance Compared to Grey Infrastructure



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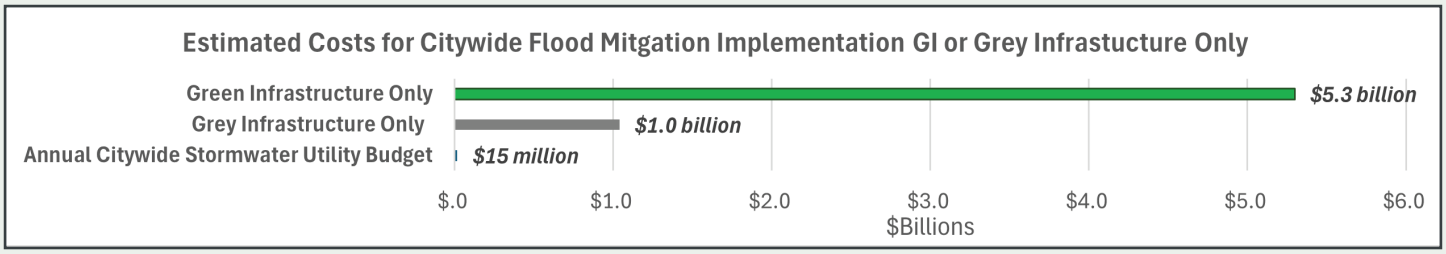
COST:

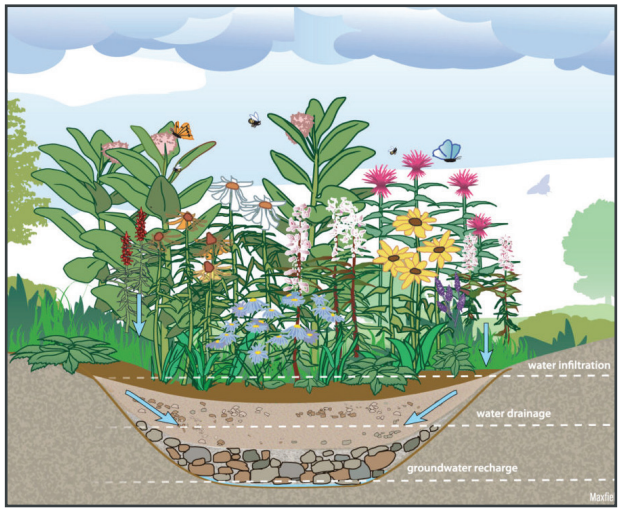
GI installation and maintenance costs pose a significant implementation challenge. The Pheasant Branch study estimated $147 million to construct GI to match grey infrastructure performance (75% DCIA Treatment); with annual maintenance at $11 million. Citywide implementation of GI as the primary flood control measure would exceed $5 billion, several times the cost of necessary grey infrastructure. Given the full annual stormwater utility budget of $15 million for all capital projects, which includes around $2 million for water quality projects, implementing all flood control solutions will take decades.



SUMMARY:

GI can mitigate flooding at high implementation levels, but it's not as cost-effective as addressing stormwater system limitations with grey infrastructure. The City does recognize the ecological, water quality, and social benefits GI offers; and that it can add resilience to the stormwater system, and encourages GI usage through the stormwater management ordinance, the rain garden program, and a GI Pilot Study. Staff also continue to strategically explore GI on City led projects. Additional resources to help property owners construct and maintain GI, such as rain gardens, on their own property can be found on the City Engineering website.

Green Infrastructure & Watershed Study:



Rain Garden Initiative:

cityofmadison.com/engineering